

WHAT IS CLAIMED AS NEW AND DESIRED TO BE SECURED BY LETTERS
PATENT OF THE UNITED STATES IS:

1. A laminated glazing material with properties of acoustic insulation and mechanical strength, said glazing material comprising two glass sheets and a single-ply intermediate layer in the form of a polymeric film and having a thickness, wherein the thickness of the intermediate layer is equal to at least $d_{\text{ref}} J_{\text{ref}}/J_c$, where:

J_c is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer;

J_{ref} is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m² for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film; and

d_{ref} is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm.

2. The laminated glazing material according to Claim 1, wherein the intermediate layer satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm, has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm.

3. The laminated glazing material according to Claim 1, wherein the intermediate layer has a loss factor greater than 0.6 and a shear modulus of between 1×10^8 and 2×10^7 N/m² in a temperature range of between 10 and 60°C and in a frequency range of between 50 and 10,000 Hz.

4. A laminated glazing material with properties of acoustic insulation and mechanical

strength, said laminated glazing material comprising two glass sheets and a single-ply intermediate layer, wherein the intermediate layer is made of a composite material, said composite material comprising a polymer and reinforcing fibers embedded in the polymer.

5. The laminated glazing material according to Claim 4, wherein the intermediate layer satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm, has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm.

6. The laminated glazing material according to Claim 4, wherein the intermediate layer has a loss factor greater than 0.6 and a shear modulus of between 1×10^8 and 2×10^7 N/m² in a temperature range of between 10 and 60°C and in a frequency range of between 50 and 10,000 Hz.

7. A polymer film having a thickness for use as an intermediate layer of a laminated glazing material, wherein the thickness is equal to at least $d_{\text{ref}} J_{\text{ref}}/J_c$, where:

J_c is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer;

J_{ref} is a reference critical energy value which corresponds to the critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m² for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film; and

d_{ref} is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm.

8. A polymer film for use as an intermediate layer of a laminated glazing material, wherein the polymer film is a composite comprising a polymer and reinforcing fibers

embedded in the polymer.

9. A process for evaluating a tearing strength of a polymer film of thickness d_1 , for use as an intermediate layer of a laminated glazing material, said process comprising the steps of:

determining a critical energy value J_c of the intermediate layer, the critical energy value representing an energy necessary for propagation of a crack initiated in the intermediate layer;

calculating a critical energy value \tilde{J}_c relative to the thickness using a relationship $\tilde{J}_c = J_c d_1$;

comparing \tilde{J}_c with a reference value \tilde{J}_{ref} , representative of a polyvinyl butyral film of 0.38 mm thickness and equal to 13.3 J/m; and

determining when the intermediate layer satisfies a tearing strength criterion when

$$\tilde{J}_c > \tilde{J}_{ref}.$$